Let's Talk EDI in Science

Dr. Christina Richey
Astrophysicist/Planetary Scientist at Jet Propulsion Laboratory at California Institute of Technology
Project Staff Scientist for the Europa Clipper Mission
Member/Past Chair: AAS Comm. On the Status of Women in Astronomy
Past Chair: DPS Prof. Culture & Climate Subcommittee
Preferred Pronouns: they, them, theirs
https://science.jpl.nasa.gov/people/Richey/

Clancy, K. B. H., K. M. N. Lee, E. M. Rodgers, and C. Richey (2017), Double jeopardy in astronomy and planetary science: Women of color face greater risks of gendered and racial harassment, J. Geophys. Res. Planets , 122, 1610–1623, doi:10.1002/2017JE005256.
http://onlinelibrary.wiley.com/doi/10.1002/2017JE005256/epdf

Jet Propulsion Laboratory
California Institute of Technology

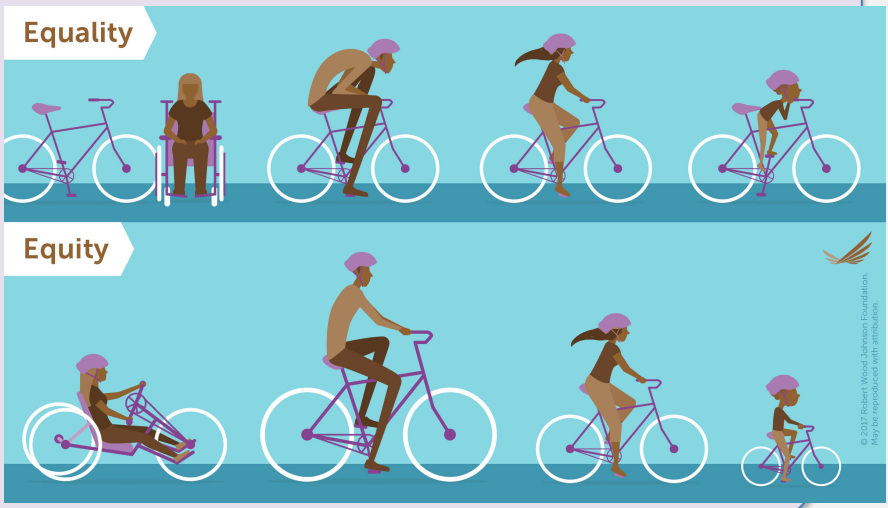
Definitions

EDI?

- Improving **EQUITY** promotes justice, impartiality and fairness within the procedures, processes and distribution of resources by institutions and systems. Tackling equity issues requires an understanding of the underlying or root causes of outcome disparities within our society.
- **DIVERSITY** refers to a broad representation of a community's demographic mix, taking into account elements of human difference focusing on racial and ethnic groups, sexual orientation, gender, gender identity, disabilities, religion, age and perspectives arising from different backgrounds.
- **INCLUSION** refers to the degree in which diverse individuals are able to participate fully in the decision- making processes within an organization or group. While a truly "inclusive" group is necessarily diverse, a "diverse" group may or may not be "inclusive."

But I thought the E was Equality, not Equity?

*Definitions from:
https://www.oregoncf.org/Templates/media/files/edi/edi_booklet_2017.pdf



Definitions

Unconscious (Implicit) Bias: the attitudes or stereotypes that affect our understanding, actions, & decisions in an unconscious manner.

This occurs regardless of the dominant group:

- Gender: Both men and woman downplay women's contributions
- Race: Both whites and minorities downplay minorities' contributions

Microaggressions: subtle, indirect, or unintentional acts of discrimination

Conscious (Explicit) Bias: an intentional prejudice in favor of or against one thing, person, or group compared with another usually in a way that's considered to be unfair.

- **Sexism**: a conscious bias: prejudice, stereotyping, or discrimination on the basis of sex.
- **Racism**: a conscious bias: prejudice, stereotyping, or discrimination on the basis of race.

Harassment: unwelcome conduct that is based on race, color, religion, sex, national origin, age, disability or genetic information.

- https://www.eeoc.gov/laws/types/harassment.cfm

What do Biases and Harassment look like in STEM:

- STEM fields are shown to have implicit bias that is impactful (both gender & race based):
  - Opportunities in mentorship [Milkman et al. 2015]
  - Opportunities in the classroom [Eddy et al. 2014; 2015; Grunspan et al. 2016]
  - Workplace conflict & stereotype issues [Williams et al. 2014; 2016; Rios & Stewart, 2015]
- WOC Science faculty have decreased, even as white women faculty have increased [Armstrong & Javanovic, 2015]
- WOC are more likely to be junior in rank [NSF, 2015]
- In physics, women (and WOC specifically) are isolated & experience microaggressions in workplace [Barthelemy et al., 2015a; 2015b]
- White women and POC are underrepresented in physical sciences to a far greater degree than the biological or social sciences [NSF, 0215]
- Women and POC experience more workplace incivilities [Cortina et al., 2013; Kabat-Farr & Cortina, 2012]

Demographics in Planetary Science

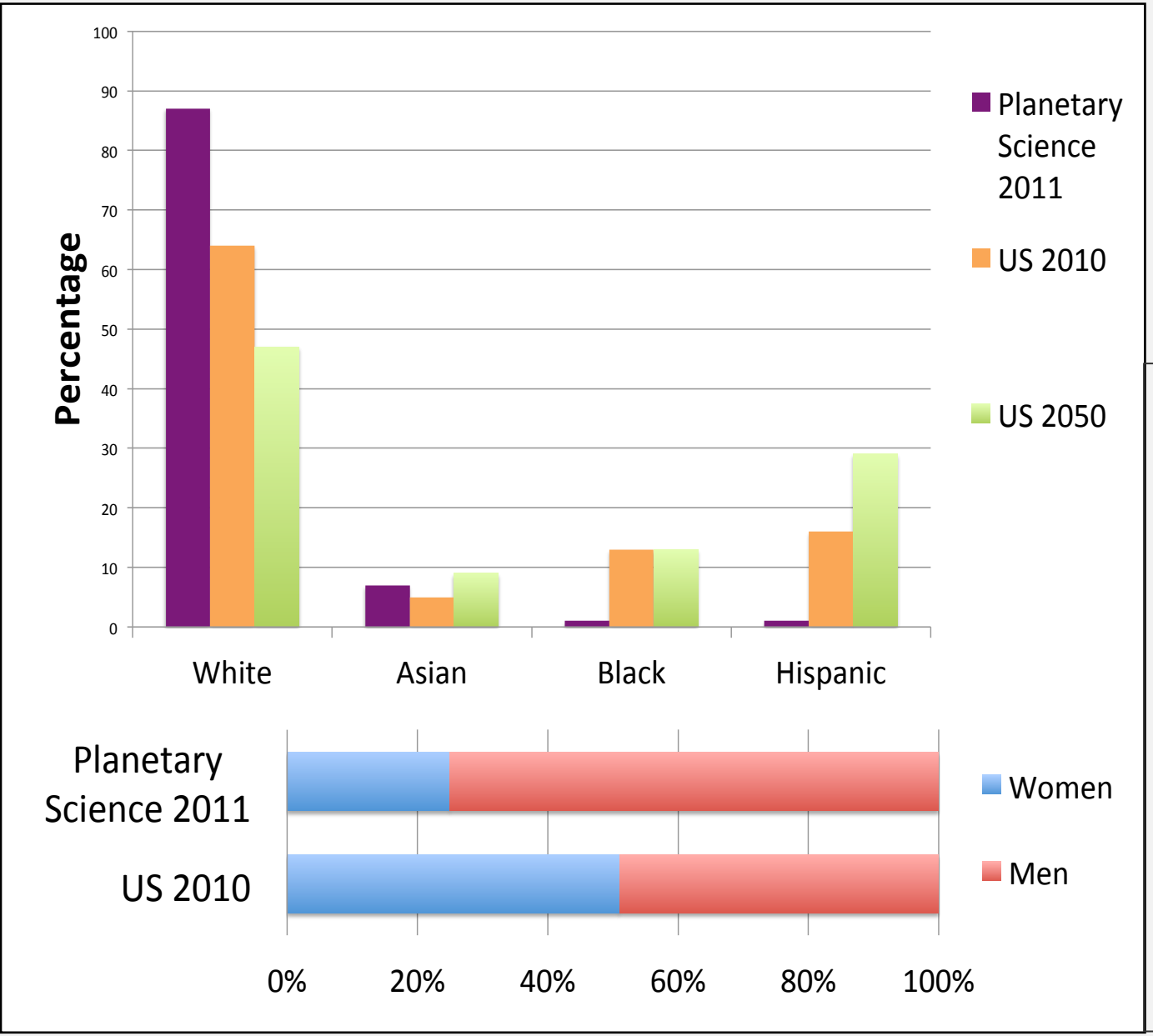


Figure by Rathbun et al. (2017), with input from the 2011 Planetary Science Workforce Survey (White et al. 2011), the 2010 US Census, and the US Population predictions (Passels and Cohn, 2008).

Women on Science Mission Teams (PSD)

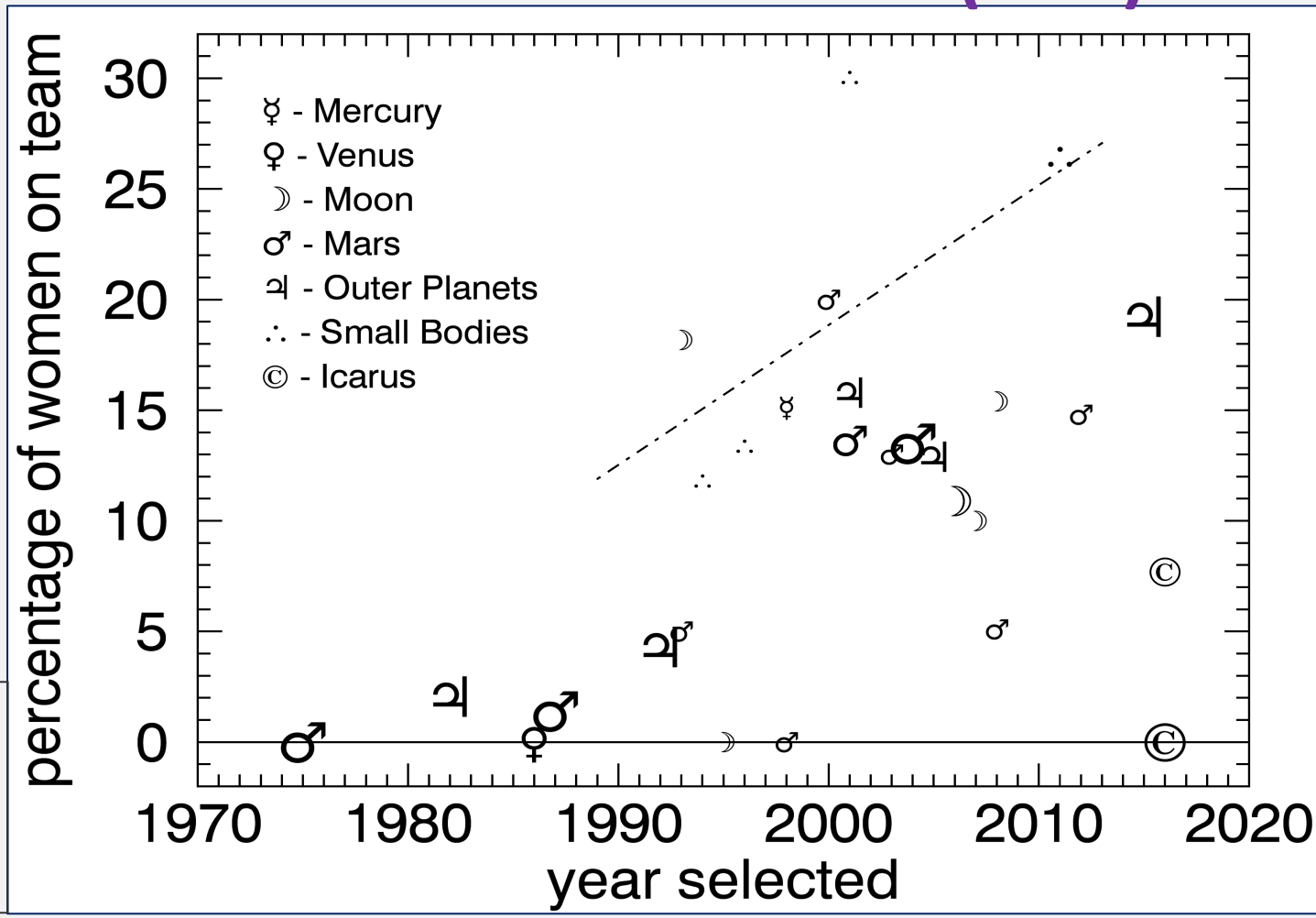


Figure by Rathbun et al. (2017).

Of 301 PI-led mission proposals from 2001-2017, only 30 had female PIs and 87% of those came through PSD solicitation
-Michael New's Diversity & Inclusion presentation to the Astrophysics Advisory Committee on April 12th, 2018

Gender Demographics in Academia

Table 12. Female Professors by Rank and Year at Top 50 Departments

Discipline	FY2002*				FY2007			
	Assistant	Associate	Full	All Ranks	Assistant	Associate	Full	All Ranks
Chemistry	21.5%	20.5%	7.6%	12.1%	21.7%	21.3%	9.7%	13.7%
Math	19.6%	13.2%	4.6%	8.3%	28.0%	15.5%	7.2%	12.1%
Computer Sci	10.8%	14.4%	8.3%	10.6%	19.5%	11.3%	11.5%	13.5%
Electrical Engr	10.9%	9.8%	3.8%	6.5%	14.5%	14.1%	6.2%	9.7%
Mechanical Engr	15.7%	8.9%	3.2%	6.7%	18.2%	12.0%	4.9%	9.0%
Physics	11.2%	9.4%	5.2%	6.6%	17.5%	12.6%	6.8%	9.5%
Civil Engr	22.3%	11.5%	3.5%	9.8%	25.3%	14.3%	7.1%	12.7%
Chemical Engr	21.4%	19.2%	4.4%	10.5%	23.7%	17.8%	8.3%	12.9%
Astronomy**	20.2%	15.7%	9.8%	12.4%	25.3%	21.6%	12.3%	15.8%
Economics	19.0%	16.3%	7.2%	11.5%	30.7%	16.0%	8.5%	15.1%
Political Science	36.5%	28.6%	13.9%	23.5%	35.9%	30.1%	17.4%	25.6%
Sociology	52.3%	42.7%	24.3%	35.8%	57.9%	45.6%	28.0%	39.7%
Psychology	45.4%	40.1%	26.7%	33.5%	44.9%	41.9%	29.9%	36.0%
Biological Sci	30.4%	24.7%	14.7%	20.1%	36.0%	30.9%	17.7%	24.8%
Earth Sciences	not available				28.6%	21.7%	10.6%	16.1%

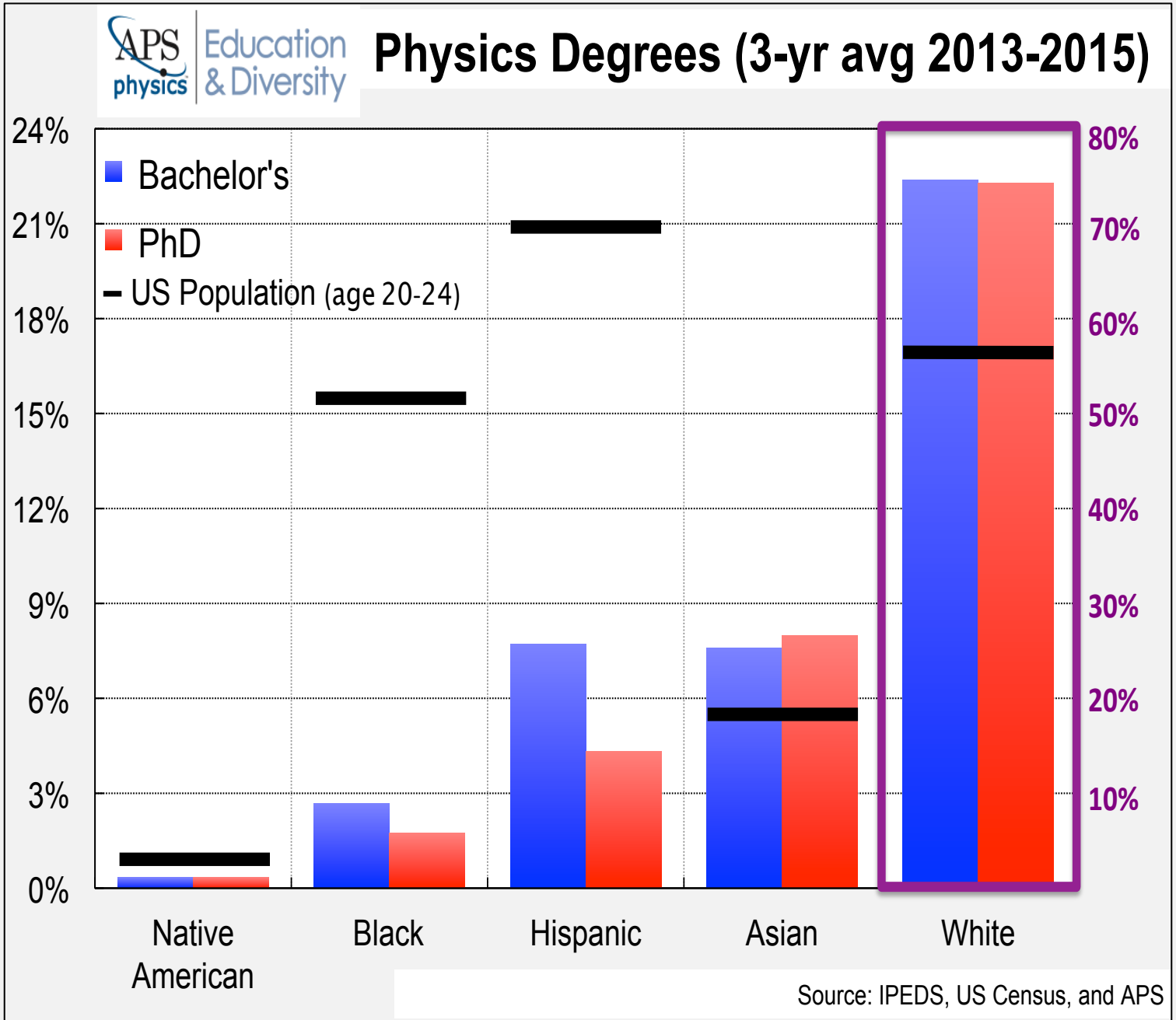
*Chemistry and astronomy data are for FY2003. **Top 40 departments

Female Profs, Top 50 Depts. [28]

http://faculty-staff.ou.edu/N/Donna.J.Nelson-1/diversity/Faculty_Tables_FY07/07Report.pdf

In many disciplines, particularly the Physical Sciences, women are at single-digit percentages of full professors, and at or below 20% for assistant professors.

Racial Demographics: Physics



URM Demographics in Academia

Table 1. URM Professors (Black, Hispanic, Native American) by Rank and Year at the Top 50

Discipline	FY2002*				FY2007			
	Assistant	Associate	Full	All Ranks	Assistant	Associate	Full	All Ranks
Chemistry	2.8%	7.5%	2.3%	3.2%	4.7%	5.4%	3.0%	3.7%
Math	6.0%	4.6%	3.0%	3.6%	2.3%	2.7%	2.2%	2.3%
Computer Science	2.1%	1.7%	1.3%	1.6%	3.1%	2.9%	1.9%	2.5%
Astronomy**	5.5%	4.0%	1.6%	2.5%	3.3%	2.1%	2.0%	2.2%
Physics	5.2%	2.8%	2.0%	2.6%	4.4%	2.2%	2.0%	2.5%
Chemical Eng.	3.4%	8.2%	4.2%	4.9%	7.7%	6.8%	4.7%	5.6%
Civil Eng.	9.3%	4.8%	3.9%	5.4%	10.5%	8.0%	4.4%	6.6%
Electrical Eng.	5.4%	8.2%	2.2%	4.3%	4.3%	4.6%	3.0%	3.6%
Mechanical Eng.	7.0%	5.4%	2.4%	3.9%	8.1%	5.3%	2.8%	4.3%
Economics	6.6%	4.4%	3.4%	4.3%	10.9%	5.7%	3.7%	5.7%
Political Science	8.0%	9.8%	4.5%	6.9%	8.3%	8.3%	5.4%	6.9%
Sociology	14.8%	12.4%	6.6%	10.1%	19.2%	11.1%	10.8%	12.9%
Psychology	12.0%	9.4%	3.1%	6.3%	12.5%	8.0%	4.5%	7.1%
Biological Sciences	5.7%	3.0%	2.1%	3.0%	6.5%	4.4%	2.5%	3.8%
Earth Sciences	not available				5.4%	5.4%	2.0%	3.4%

*Chemistry and astronomy data are for FY2003. **Top 40 departments in FY2007

URM Profs, Top 50 Depts. [28]

http://faculty-staff.ou.edu/N/Donna.J.Nelson-1/diversity/Faculty_Tables_FY07/07Report.pdf

The CSWA Survey on Workplace Climate

Kathryn B. H. Clancy[2], Katharine M. N. Lee[2],
Erica M. Rodgers[3], & Christina R. Richey[1]

1. The AAS Committee of the Status of Women in Astronomy (CSWA), christina.richey.2@gmail.com.
2. University of Illinois, Urbana-Champaign, IRB approval (#15354, University of Illinois)
3. Space Science Institute, Boulder, Colorado

With Gracious Support from the AAS CSWA!

Clancy, K. B. H., K. M. N. Lee, E. M. Rodgers, and C. Richey (2017), Double jeopardy in astronomy and planetary science: Women of color face greater risks of gendered and racial harassment, J. Geophys. Res. Planets , 122, 1610–1623, doi:10.1002/2017JE005256.
http://onlinelibrary.wiley.com/doi/10.1002/2017JE005256/epdf

Survey Construction and Recruitment

lgbt+physicists

Adapted survey questions regarding workplace climate

39 questions Administered via Survey Monkey website January – March 2015

Recruitment

Women in Astronomy Blog

Featured at 225th AAS Meeting

AAS Division of Planetary Sciences

The Planetary Exploration Newsletter

The AAS Women Newsletter

Multiple Facebook groups (in community)

Several academic departments

Over 400 astronomers and planetary scientists responded

Results

Regarding current position

Negative Language Heard

88% heard from peers
51.9% heard from supervisors
88% from others

Responses to Harassment

39% report verbal harassment
9% report physical harassment

Safety

27% have felt unsafe

11% have skipped at least one professional event because felt unsafe

Statistically significant associations

- hearing negative comments from peers and supervisors
- experiencing verbal and physical harassment
- feeling unsafe

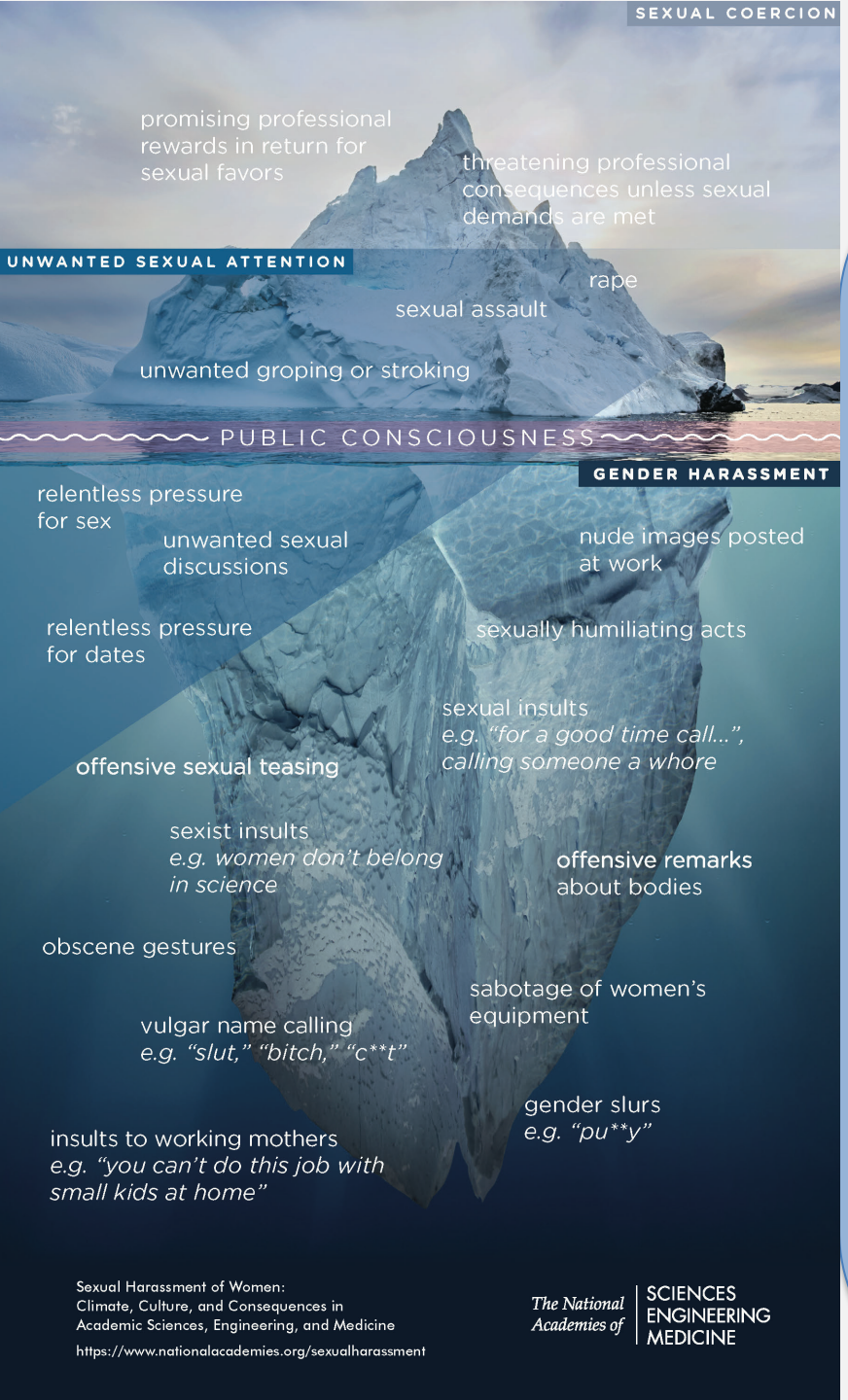
Career Consequences to Climate

Women of Color face harassment in intersectional ways:

- 40% of women of color & 27% of white women in sample have felt unsafe due to gender.
- 28% of women of color have felt unsafe due to race

→ Loss of professional opportunities for women generally and men and women of color

- Negative climate keeps numbers low especially for women of color
  - increases the risk of stereotype threat [Steele, 1997; Steele and Aronson, 1998]
  - underestimation of performance [Keller and Dauenheimer, 2003; Nielsen, 2015; Shapiro and Williams, 2012]
  - lack of critical mass in job searches [Valian, 1998]



NASEM Report on Sexual Harassment (2018):

http://sites.nationalacademies.org/shstudy/index.htm

Findings:

- ~50% of women faculty and staff in academia experience sexual harassment.
- Between 20-50% of students in science, engineering, and medicine experience sexual harassment from faculty or staff.
- The cumulative effect of sexual harassment is significant damage to research integrity and a costly loss of talent in academic sciences, engineering, and medicine.
- The 2 characteristics most associated with higher rates of sexual harassment are (a) male-dominated gender ratios and leadership and (b) an organizational climate that communicates tolerance of sexual harassment
- **Organizational climate is, by far, the greatest predictor of the occurrence of sexual harassment, and ameliorating it can prevent people from sexually harassing others.**

APS Report LGBT Climate in Physics (2016):

https://www.aps.org/programs/lgbt/upload/LGBTClimateInPhysicsReport.pdf

Findings:

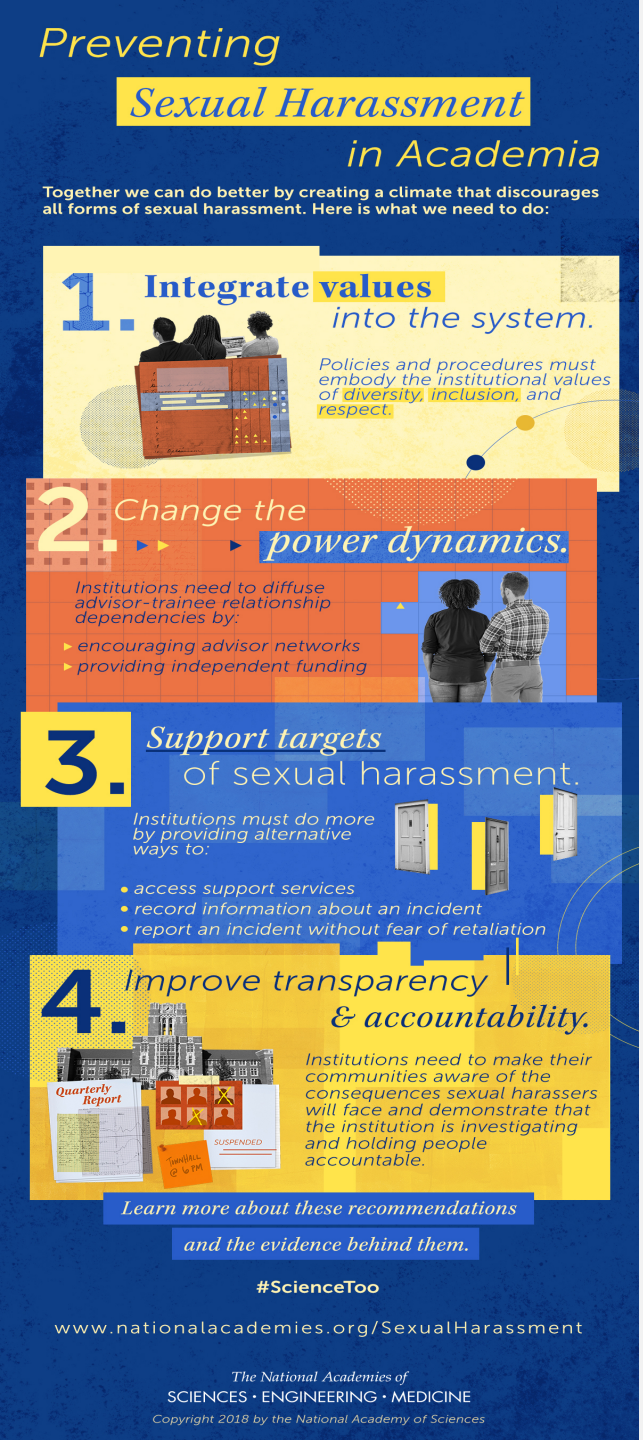
- LGBT physicists have faced uneven protection & support from legislation and policies.
- The overall climate experienced by LGBT physicists was highly variable.
- In many physics environments, social norms established expectations of closeted behavior.
- Isolation was a common theme for many LGBT physicists.
- A significant fraction of LGBT physicists have experienced or observed exclusionary behavior.
- **LGBT physicists with additional marginalized identities faced greater level of discrimination.**
- **Transgender and gender-nonconforming physicists encountered the most hostile environments.**
- Many LGBT physicists were at risk for leaving their workplace or school.
- LGBT physicists reported trouble identifying allies to help mitigate isolation, exclusion, or marginalization.

CSWA Survey on Workplace Climate: Solutions

1. Education on appropriate workplace behavior required for all employees [Clancy et al., 2014; Cortina et al., 2013]
2. Diversity and cultural awareness training necessary to raise awareness and understanding of the problems faced by women of color and other underrepresented groups [Norman et al., 2013]
3. Leaders need to model inclusive behavior and define inclusive culture [Clancy et al., 2014; Cortina et al., 2013 Settles et al., 2006]
4. When abuses are reported, "instigators should be swiftly, justly, and consistently sanctioned" [Cortina et al., 2013, p. 1600]

Initiatives to increase numbers of women of color [Norman et al., 2013]

- Build cohorts of women of color to enable creation of peer networks
- Encourage fair hiring practices to minimize implicit bias
- Incentivize departments who support women of color



NASEM Report on Sexual Harassment:

http://sites.nationalacademies.org/shstudy/index.htm

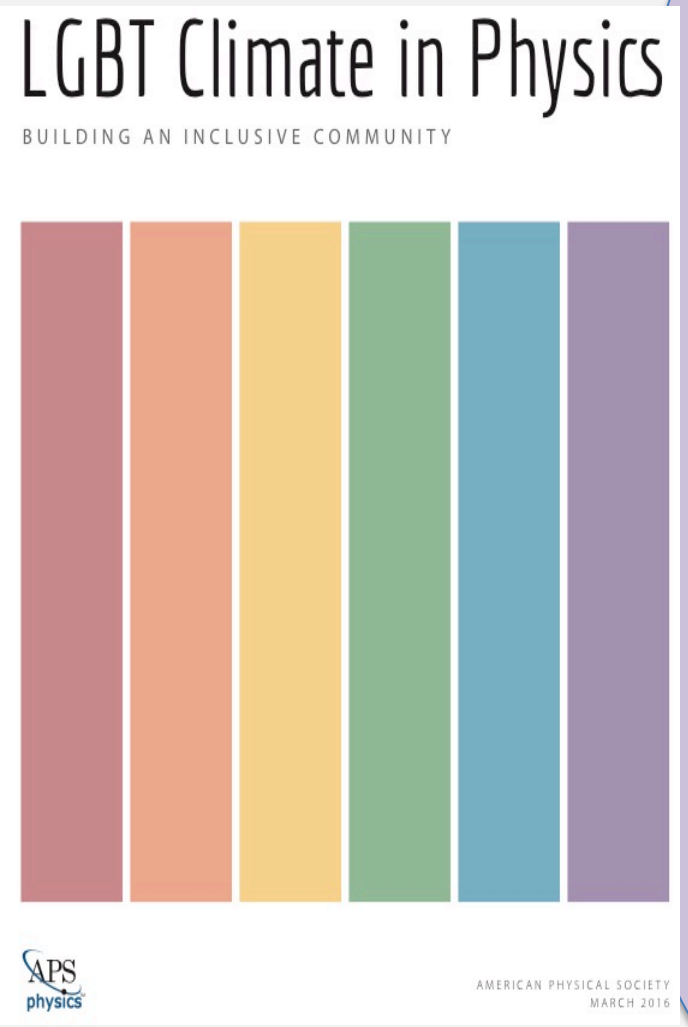
Recommendations:

- Leaders in academic institutions and research and training sites **must pay increased attention to and enact policies** that cover gender harassment as a means of addressing the most common form of sexual harassment and of preventing other types of sexually harassing behavior.
- **Move beyond legal compliance to address culture and climate.** Academic institutions, research and training sites, and federal agencies should move beyond interventions or policies that represent basic legal compliance and that rely solely on formal reports made by targets.
- Professional societies should accelerate their efforts to be viewed as organizations that are helping to create culture changes that reduce or prevent the occurrence of sexual harassment.

Recommendations for Institutions:

- Create diverse, inclusive, and respectful environments
- Diffuse the hierarchical and dependent relationship between trainees and faculty
- **Provide support for targets**
- **Improve transparency and accountability**
- Strive for strong and diverse leadership
- Make the entire academic community responsible for reducing and preventing sexual harassment

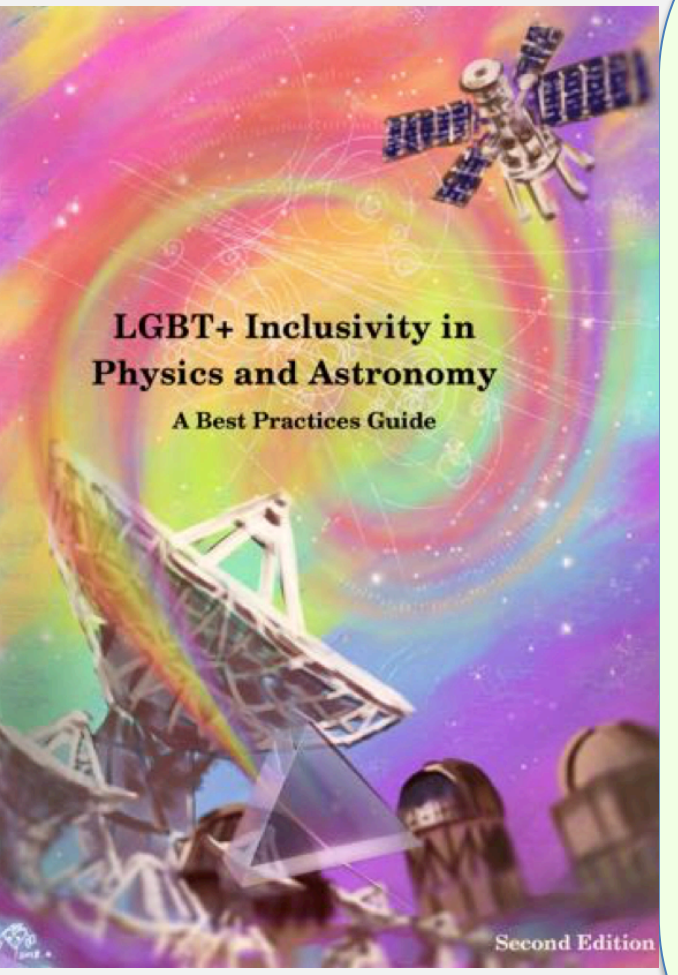
APS Report LGBT Climate in Physics (2016):
https://www.aps.org/programs/lgbt/upload/LGBTClimateInPhysicsReport.pdf



Recommendations:

- **Ensure a safe and welcoming environment** at meetings.
  - **Establish written best practices**
  - **Implement Code of Conduct**
- Address the need to systematically accommodate name changes in publication records.
- Develop advocacy efforts that support LGBT equity and inclusion
- Promote LGBT-inclusive practices in academia, national labs, and industry.
  - Disseminate Best Practice Guide developed by LGBT+ physicists
  - Develop training program on inclusive workplace and mentorship practices
  - Utilize Climate Site Visit Programs.
- Implement LGBT-inclusive mentoring programs.
  - Includes creating a professional network of LGBT mentors and mentees and hosting networking events.
- Support the establishment of a Forum on Diversity and Inclusion.

LGBT+ Inclusivity in Physics & Astronomy Best Practices Guide (2nd ed, 2018):
https://sgma.aas.org/sites/sgma.aas.org/files/LGBTInclusivityPhysicsAstronomy-BestPracticesGuide2ndEdn_small.pdf



Recommendations:

- **Assess and address**: participate in or conduct a climate survey, collecting demographic information, carrying out classroom climate assessments. Establish a departmental climate committee and/or liaison and explicit LGBT+ supportive policies.
- **Break the silence and invisibility**: Initiate department-wide discussions of LGBT+ concerns, highlight the scientific contributions of LGBT+ department members at all levels, join an "Out List" as an ally or LGBT+ scientist, identify LGBT+ supportive mentors, invite LGBT+ speakers to campus.
- **Educate and advocate**: Participate in LGBT+ friendly climate and anti-bias training, work for campus-wide LGBT+ supportive practices such as supportive first responders and gender-inclusive restrooms and accompanying signage.
- **Set the example and expectations**: include preferred pronouns in your email signature, invite students and/or meeting participants to share their preferred pronouns, articulate classroom environment expectations on the first day of class, speak up in response to discriminatory behavior and report where appropriate.
- **Support and include**: Plan gender-neutral and inclusive social events, create LGBT+ safe spaces in your department, provide equal restroom access, include LGBT+ faculty in positions of authority, provide support for participation in LGBT+ networking events, ensure LGBT+ needs are considered in dual-career hires, family-friendly policies, and benefits.

Tips to do better

- Collect demographic information & **use it to build policies**
- Diversify your network & institution
  - Aim for 30% across all levels (proportionality matters!)
  - Make sure your department/institution seminars, committees, panels, etc. have a good diversity balance (race, gender, etc.)
  - Don't reinforce stereotypes when diversifying
- Amplify minority voices in the room during discussions
- Foster and draw on mentorship roles & responsibilities
- Make sure you're aware of unconscious/implicit bias

Unconscious (Implicit) Bias: the attitudes or stereotypes that affect our understanding, actions, & decisions in an unconscious manner.

This occurs regardless of the dominant group:

- Gender: Both men and woman downplay women's contributions
- Race: Both whites and minorities downplay minorities' contributions

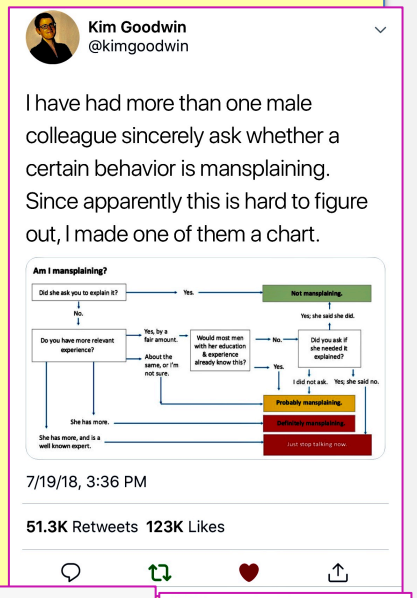
Mitigating Implicit Bias

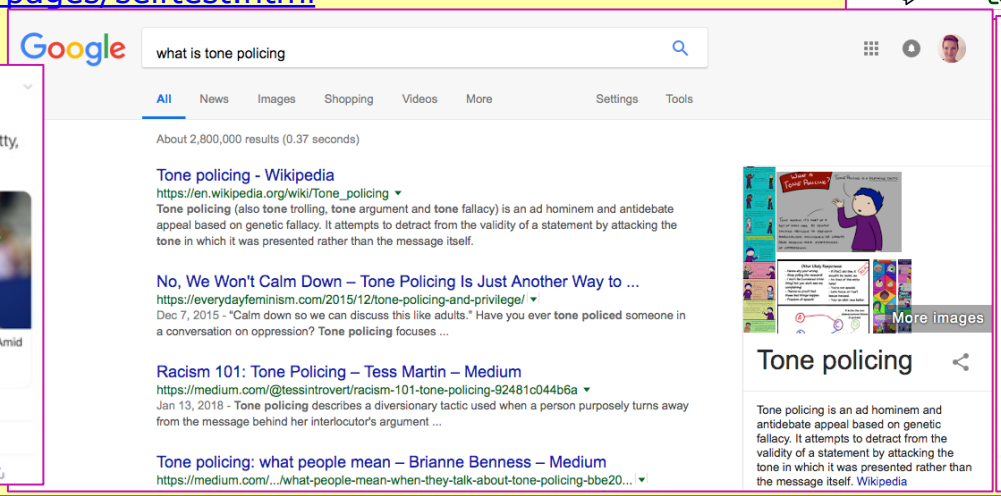
- Take the Implicit Bias Test
  - https://implicit.harvard.edu/implicit/
- Discuss how Implicit Bias affects your daily work efforts:
  - Resumes, Job credentials, Fellowships, Hiring, Awards, Promotions, Proposal Reviews
- Discuss improving hiring & selection processes, including dual anonymous reviews:
  - https://outerspace.stsci.edu/display/APRWG/Recommendations+of+the+Working+Group+on+Anonymizing+Proposal+Reviews
- Utilize Gender Bias calculators when writing advertisements and letter of recommendation:
  - http://www.tomforth.co.uk/genderbias/
  - http://textio.com
- Work to create policies that can mitigate Implicit Bias (Bauer & Baltes, 2002, *Sex Roles* 9/10,465)
  - Decrease time pressure & distractions in evaluation process
  - Rate on explicit criteria that were determined ahead of time.
  - Point to specific evidence supporting judgments.

Tips to do better

- Avoid making sexual remarks when in the work environment
  - Also avoid trying to make sexual advancements at folks beneath you in the power dynamic.
- Offer and Take Bystander Intervention Training!
  - http://stepupprogram.org
- **LEAN IN TO YOUR DISCOMFORT**
  - Learn about benevolent sexism, mansplaining, & tone arguments & avoid these behaviors
    - It's **NOT** the job of marginalized community members to teach you these things. Instead, try google, twitter, social science literature, talks like this, etc.
  - Know when to listen
  - Don't belittle or dismiss someone
  - **Avoid victim blaming**
- **Don't expect a cookie when you do all of these things**

- For those who have been an ally for a long time, or you are someone who has dealt personally with being harassed or assaulted, it's okay to take breaks. Remember Self Care. Avoid Burnout. http://www.compassionfatigue.org/pages/selftest.html





Tips to do better: APL

What are y’all doing right?

What can you do better right now?

What can you work to improve long term?

Additional Resources

Committee on the Status of Women in Astronomy page:
https://cswa.aas.org

Committee on the Status of Women in Astronomy Unofficial Blog:
http://womeninastronomy.blogspot.com

Committee on the Status of Minorities in Astronomy page:
https://csma.aas.org

Committee on the Status of Minorities in Astronomy Unofficial Blog:
http://astronomyincolor.blogspot.com

Working Group on Accessibility and Disability (WGAD) page:
https://wgad.aas.org

Sexual-Orientation and Gender Minorities in Astronomy (SGMA) page:
https://sgma.aas.org

Rape, Abuse and Incest National Network page on Sexual Harassment:
https://rainn.org/get-information/types-of-sexual-assault/sexual-harassment

Women in Planetary Science's Blog: http://womeninplanetaryscience.wordpress.com/blogroll/

NASEM Report on Sexual Harassment in Academia:
http://sites.nationalacademies.org/shstudy/index.htm

LGBT+ Inclusivity in Physics in Astronomy Best Practices Guide:
https://sgma.aas.org/sites/sgma.aas.org/files/LGBTInclusivityPhysicsAstronomy-BestPracticesGuide2ndEdn_small.pdf

Clancy, K. B. H., K. M. N. Lee, E. M. Rodgers, and C. Richey (2017), Double jeopardy in astronomy and planetary science: Women of color face greater risks of gendered and racial harassment, J. Geophys. Res. Planets , 122, 1610–1623, doi:10.1002/2017JE005256.
http://onlinelibrary.wiley.com/doi/10.1002/2017JE005256/epdf

Be the change

Literature

1. Steinpreis RE, Anders KA, Ritzke D. The impact of gender on the review of the curricula vitae of job applicants, Sex Roles, 1999; 41, 509. http://www.cos.gatech.edu/facultyres/Diversity_Studies/Steinpreis_Impact%20of%20gender%20on%20review.pdf

2. Bertrand B & Mullainathan S. Discrimination in the Job Market in the United States. Poverty Action Lab, 2004; 3, 1-27.

3. Rathburn JA, Castillo-Rogez J, Diniega S, Hurley D., New M, Pappalardo RT, Prockter L, Sayanagi KM, Schug J, Turtle EP, Vasavada AR. Historical Treads of Participation of Women Scientists in Robotic Spacecraft Mission Science Teams, 2016; 332.01, 48th Annual Division for Planetary Sciences Conference.

4. Knezek, P. Professional Culture and Climate: Addressing Unconscious Bias, 2016; 315, 48th Annual Division for Planetary Sciences Conference. https://womeninplanetaryscience.wordpress.com/2016/10/27/dpsepsc-2016-plenary-on-unconscious-bias-by-dr-patricia-knezek/

5. Bejerano AR, Bartosh TM. LEARNING MASCULINITY: UNMASKING THE HIDDEN CURRICULUM IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS COURSES. 2015;21(2):107-24. doi: 10.1615/JWomenMinorScienEng.2015011359.

6. Milkman K, Akinola M, Chugh D. What Happens Before? A Field Experiment Exploring How Pay and Representation Differentially Shape Bias on the Pathway into Organizations. Journal of Applied Psychology. 2015;100(6):1678-712. doi: http://dx.doi.org/10.1037/apl0000022.

Literature

7. Moss-Racusin CA, Dovidio JF, Brescoll VL, Graham MJ, Handelsman J. Science faculty's subtle gender biases favor male students. Proceedings of the National Academy of Sciences. 2012;109(41):16474-9.

8. Eddy SL, Brownell SE, Thummaphan P, Lan M-C, Wenderoth MP. Caution, Student Experience May Vary: Social Identities Impact a Student's Experience in Peer Discussions. CBE-Life Sciences Education. 2015;14(4). doi: 10.1187/cbe.15-05-0108.

9. Eddy SL, Brownell SE, Wenderoth MP. Gender Gaps in Achievement and Participation in Multiple Introductory Biology Classrooms. CBE Life Sciences Education. 2014;13(3):478-92. doi: 10.1187/cbe.13-10-0204. PubMed PMID: PMC4152209.

10. Grunspan DZ, Eddy SL, Brownell SE, Wiggins BL, Crowe AJ, Goodreau SM. Males Under-Estimate Academic Performance of Their Female Peers in Undergraduate Biology Classrooms. PloS one. 2016;11(2):e0148405.

11. Rios D, Stewart AJ. INSIDER AND OUTSIDER-WITHIN STANDPOINTS: THE EXPERIENCES OF DIVERSE FACULTY IN SCIENCE AND ENGINEERING FIELDS. 2015;21(4):295-322. doi: 10.1615/JWomenMinorScienEng.2015010375.

12. Armstrong MA, Jovanovic J. STARTING AT THE CROSSROADS: INTERSECTIONAL APPROACHES TO INSTITUTIONALLY SUPPORTING UNDERREPRESENTED MINORITY WOMEN STEM FACULTY. 2015;21(2):141-57. doi: 10.1615/JWomenMinorScienEng.2015011275.

Literature

13. Barthelemy R, McCormick M, Henderson C. Barriers Beyond Equity: An Exploratory Study of Women Graduate Students' Career Pathways in Astronomy. International Journal of Gender, Science and Technology. 2015;7(1):57-73.

14. Barthelemy RS, McCormick M, Henderson C, editors. Understanding Women's Gendered Experiences in Physics and Astronomy Through Microaggressions. 2014 Phys Educ Res Conf Proc; 2015.

15. Ko LT, Kachchaf RR, Hodari AK, Ong M. Agency of women of color in physics and astronomy: Strategies for persistence and success. Journal of Women and Minorities in Science and Engineering. 2014;20(2).

16. NSF. Women, Minorities, and Persons with Disabilities in Science and Engineering 2015 [cited 2016]. Available from: http://www.nsf.gov/statistics/2015/nsf15311/digest/theme4.cfm.

Literature

17. Flores E, Tschann JM, Dimas JM, Bachen EA, Pasch LA, de Groat CL. Perceived Discrimination, Perceived Stress, and Mental and Physical Health Among Mexican-Origin Adults. Hispanic Journal of Behavioral Sciences. 2008;30(4):401-24. doi: Doi 10.1177/0739986308323056. PubMed PMID: ISI:000259958000001.

18. Lewis TT, Aiello AE, Leurgans S, Kelly J, Barnes LL. Self-reported experiences of everyday discrimination are associated with elevated C-reactive protein levels in older African-American adults. Brain Behav Immun. 2010;24(3):438-43. Epub 2009/12/01. doi: 10.1016/j.bbi.2009.11.011. PubMed PMID: 19944144; PubMed Central PMCID: PMC2826562.

19. Lewis TT, Kravitz HM, Janssen I, Powell LH. Self-reported experiences of discrimination and visceral fat in middle-aged African-American and Caucasian women. American journal of epidemiology. 2011;173(11):1223.

20. Mays VM, Cochran SD, Barnes NW. Race, race-based discrimination, and health outcomes among African Americans. Annu Rev Psychol. 2007;58:201-25.

21. McClure HH, Snodgrass JJ, Martinez CR, Eddy JM, Jiménez RA, Isiordia LE. Discrimination, psychosocial stress, and health among Latin American immigrants in Oregon. American Journal of Human Biology. 2010;22(3):421-3. doi: 10.1002/ajhb.21002.

Literature

22. Beatty Moody DL, Brown C, Matthews KA, Bromberger JT. Everyday Discrimination Prospectively Predicts Inflammation across 7-Years in Racially Diverse Midlife Women: Study of Women's Health across the Nation. Journal of Social Issues. 2014;70(2):298-314. doi: 10.1111/josi.12061.

23. Stock SR, Tissot F. Are there health effects of harassment in the workplace? A gender-sensitive study of the relationships between work and neck pain. Ergonomics. 2012;55(2):147-59.

24. Barling J, Dekker I, Loughlin CA, Kelloway EK, Fullagar C, Johnson D. Prediction and replication of the organizational and personal consequences of workplace sexual harassment. Journal of Managerial Psychology. 1996;11(5):4-25.

25. Loi NM, Loh JMI, Hine DW. Don't rock the boat: The moderating role of gender in the relationship between workplace incivility and work withdrawal. Journal of Management Development. 2015;34(2):169-86. doi: doi:10.1108/JMD-12-2012-0152.

26. Major B, Spencer S, Schmader T, Wolfe C, Crocker J. Coping with negative stereotypes about intellectual performance: The role of psychological disengagement. Personality and social psychology bulletin. 1998;24(1):34-50.

27. Cortina LM, Kabat-Farr D, Leskinen EA, Huerta M, Magley VJ. Selective incivility as modern discrimination in organizations evidence and impact. Journal of Management. 2013;39(6):1579-605.

Literature

28. Nelson DJ & Brammer CN. An analysis of minorities in Science and Engineering Faculties at Research Universities, 2010, http://faculty-staff.ou.edu/N/Donna.J.Nelson-1/diversity/Faculty_Tables_FY07/07Report.pdf.

29. Vertesi, J. The "d" word. Presented at the 2017 Winter Outer Planets Assessment Group Meeting, http://www.lpi.usra.edu/opag/meetings/feb2017/presentations/Vertesi.pdf (all references included in the next few slides)

30. The NASEM Report of Sexual Harassment in Academia: http://sites.nationalacademies.org/shstudy/index.htm

31. The APS Report LGBT Climate in Physics (2016): https://www.aps.org/programs/lgbt/upload/LGBTClimateInPhysicsReport.pdf

32. LGBT+ Inclusivity in Physics & Astronomy: A Best Practices Guide (2nd Edition): https://sgma.aas.org/sites/sgma.aas.org/files/LGBTInclusivityPhysicsAstronomy-BestPracticesGuide2ndEdn_small.pdf